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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,558	04/07/2005	Mitsuru Takei	265706US0XPCT	8827

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
ROBERTS, LEZAH	
ART UNIT	**PAPER NUMBER**
1614	

DATE MAILED: 03/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/530,558	TAKEI ET AL.	
	Examiner	Art Unit	
	Lezah W. Roberts	1614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-10 and 15* is/are rejected.

7)☒ Claim(s) *5-6 and 11-14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *A and B*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims

Claim Objections

Claims 5-6 and 11-14 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 102 - Anticipation

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsunae et al. (US 6,174,935).

Matsunae et al. teaches dental adhesive kits comprising a self-etching primer and a bonding agent. The self-etching primer includes a methacrylate or acrylate ranging form 1.0 to 50% of the composition. The methacrylate or acrylate have an acidic group and have at least one unsaturated double bond. The composition comprises a water-soluble organic solvent, which makes up 1.0 to 98% by weight of the composition.

Water is also included in the primer composition and its makes up 1.0 to 90% by weight of the composition. The bonding agent comprises from 10 to 90% by weight of a methacrylate or acrylate having neither an acidic group nor a hydroxyl group and having at least one unsaturated double bond, and comprises 10 to 90% by weight of the composition. These monomers include methyl methacrylate and ethyl methacrylate (col. 4, lines 44-49), two monomers that qualify as volatile solvents according to page 20 of the instant specification. The bonding agent also comprises an additional monomer without an acidic group but with a hydroxyl group and composes from 10% -90% of the composition. These monomers include 2,2-bis[4-(2-hydroxy-3-methacryloxypropoxy) phenyl]propane and 2-hydroxy-1,3-dimethacryloxypropane (col. 5, lines 41-48), monomers that qualify as polyfunctional monomers, as recited by the instant claims. A photopolymerization initiator is included in the bonding agent composition and makes up 0.1 to 5.0% by weight of the composition. The disclosed percentages encompass the percentages recited in claim 2. The bonding agent may also comprise a filler, inorganic fillers are preferred, and a silica powder, and a glass powder (e.g., a barium glass powder, a fluoroaluminosilicate glass powder) are particularly preferred. Further, if desired, fillers processed with a surface-treating material such as a silane coupling agent can be used. The dentin is treated with the self-etching primer wherein the (meth)acrylate monomer penetrates into the dentin while decalcifying the dentin. Then, after drying the water-soluble organic solvent in the self-etching primer, the one-pack type bonding agent with superior penetration properties is applied onto a tooth surface. The polymerizable component in the self-etching primer penetrates into the dentin and

is integrated with the bonding agent, whereby the resin monomer reliably penetrates into the decalcified dentin. Thus, high-strength adhesion is attained (col. 2,lines 39-57). The photopolymerization of the bonding agent is achieved upon irradiation of active rays such as ultraviolet light or visible rays (col. 6, lines 47-49). The method of applying the disclosed invention encompasses claim 7. In regards to claims 8-10, although the disclosed invention discloses two types of composition, the coating and the surface smoothing composition are similar. The Applicant does not specify within the claims the compositions are individual compositions, therefore the invention of the reference encompasses the instant claims. The reference anticipates the instant claims insofar as it teaches a dental kit comprising a primer composition and a bonding agent (or surface smoothing composition).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1) Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunae et al. (US 6,174,935) in view of Ying (EP 0 173 567).

The primary reference is discussed above in the anticipation section subsection 1. The photoinitiators of the reference includes camphorquinone and benzil. The dental adhesive kit of the reference can adhere a dental restorative material to a tooth structure firmly and reliably and has superior sealing properties. The composition also are simple to handle (col. 21, lines 14-21). The reference differs from the instant claims insofar as it does not teach using acylphosphine oxides as photopolymerization initiators.

Ying teaches methods of treating teeth with photopolymerizable compositions. The compositions include acylphosphine oxide photoinitiators, which encompasses claim 3. The acylphosphine oxide catalyst system of the disclosed invention provides ultimate properties similar to those which can be obtained by camphoroquinone/benzil systems, but with added desirable effects. The composition provides an optically clear resin as opposed to the light orange-yellow resin obtained with the camphoroquinone system. The catalyst comprises 0.1% to 5% of the composition. The preferred acylphosphine oxide was 2,4,6-trimethylbenzoyldiphenylphosphine oxide (page 8, lines 25-32), as recited in claim 4. The compositions may also include fillers when making a composite composition. Fillers include silica, powdered glass, and powdered quartz (page 4, lines 7-9). The ingredients of one of the suitable fillers include Al_2O_3, B_2O_3,

BaO and SiO_2, similar to those compounds found on page 17 or the instant specification, thereby encompassing claim 10. The compositions also comprise polyfunctional monomers and a preferred aspect of the invention includes monofunctional monomers in conjunction with the above monomers. These monomers may also act as volatile solvents. In the examples of table 1, benzyl methacrylate is incorporated into the compositions at a concentration of 15 parts by weight, about 15% by weight, which encompasses the instant claims for a volatile solvent. The polyfunctional monomer ranges from about 85 to 100 parts by weight (83% to 98%). The reference discloses before the compositions are applied to the teeth, the teeth are etched with acid (page 15). The reference differs from the instant claims insofar as it does not disclose a self-etching primer solution is applied to the teeth before applying the composition.

It would have been obvious to one of ordinary skill in the art to have used the photoinitiator in the compositions of the primary reference motivated by the desire to have a composition that would not cause discoloration of the teeth and would produce a optically clear finish as disclosed by the secondary reference.

2) Claims 1-4, 7-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ying (EP 0 173 567) in view of Nakatsuka et al. (EP 0 980 682).

The primary reference is as stated above. The reference discloses before the application of the disclosed compositions an etching solution or a bonding agent may be applied to the teeth. The etching composition is applied and washed off. After the

etching solution is washed off, the teeth are dried (page 15). The reference differs from the instant claims insofar as it does not disclose a self-etching primer and a coating (bonding) composition is applied to the teeth before applying the composition.

Nakatsuka et al. teach bonding compositions for dental use. The compositions have two components, which include a primer composition and an adhesive composition. The primer composition comprises a polymerizable monomer, which makes up 0.000001% to 50% by weight of the composition. The solvent of the primer compositions may be a mixture of water and organic solvents such as ethanol, methanol, acetone and isopropanol (page 13, paragraph 0031) of the primer composition and makes up 50% to 99.999999% weight of the composition. The bonding agent composition comprises a photopolymerization initiator such as acylphosphine oxide, preferably 2,4,6-trimethylbenzoylethoxyphenylphosphine oxide (page 13, paragraphs 0037-0038) and a photopolymerizable monomer. The initiator makes up 0.5% to 10% of the composition. The two compositions are added by applying the polymer first followed by the bonding agent. The compositions are cured by light. The restoration material is then added to the second composition. The reference differs from the instant claims insofar as it does not disclose a surface smoothing composition in the dental compositions.

It would have been obvious to one of ordinary skill in the art to have used the primer and adhesive composition before treating the teeth with the compositions of the primary reference motivated by the desire to avoid the washing of the etching solution

and drying of the teeth as well as to have better adhesion of the coating or composite material to the dentin or enamel disclosed by the secondary reference.

Claims 1-4, 7-10 and 15 are rejected. Claims 5-6 and 11-14 are objected to.

No claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lezah W. Roberts whose telephone number is 571-272-1071. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lezah Roberts
Patent Examiner
Art Unit 1614

Frederick Krass
Primary Examiner
Art Unit 1614